Appl. No. 10/714,416
Transmitted by Facsimile on: April 10, 2007
Transmitted by Facsimile to: 571-273-8300

Amendments to the Drawings.

None.

REMARKS/ARGUMENTS

Claims 1-22 are pending. Claims 1, 3, 6, 9, 12, and 17 are independent claims. The remaining claims depend, directly or indirectly, from the independent claims. All of the claims are rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent Application Publication Number 2003/0171934 A1 (hereinafter "Zhang"). Applicant disagrees with the rejections for the reasons set forth below.

Claim 1.

Claim 1 recites a method for encoding information signals, comprising:

> loading information symbols into a data array with $n^{(1)}$ rows and $n^{(2)}$ columns, wherein each column has $k_i^{(1)}$ information symbols, and wherein $k^{(1)}$ is an array that has at least two different values;
>
> encoding each column with a code $C_i^{(1)}$ from a family of nested codes $\mathbf{C}^{(1)}$, wherein $\mathbf{C}^{(1)}$ includes two different nested codes; and
>
> encoding each row with a code $C^{(2)}$.

Claim 1 was rejected with reference to Fig. 8 and Sections [0053] and [0054] of Zhang. Fig. 8 discloses four arrays of information bits, each of a different size. In Zhang, each "array" in Fig. 8 is referred to as a "layer". Zhang states in section [0054], "Data structure 80 has four (4) layers, 82, 84, 86, 88 of progressively increasing quality." Each "layer" (82, 84, 86, 88) has its own information bits (821, 841, 861, 881), its own column FEC (822, 842, 862, 882), and its own row FEC (823, 843, 863, 883).

However, unlike claim 1 of the present application, Fig. 8 of Zhang fails to teach or suggest a data array in which "*each column has $k_i^{(1)}$ information symbols, and wherein $k^{(1)}$ is an array that has at least two different values*". In contrast, Fig. 8 of Zhang teaches "layers" in which, for any given layer, each column has the same number of information symbols. The columns of information symbols do not have at least two different values in any of the "layers" disclosed in Fig. 8.

In contrast, the present invention claims a data array in which "*each column has $k_i^{(1)}$ information symbols, and wherein $k^{(1)}$ is an array that has at least two different values*". Zhang does show using layers of different sizes. However, it is well known to use different sized arrays for

different applications. In the case of Zhang, the different sized "layers" represent audio information having different levels of quality and, therefore, requiring different amounts of information bits to achieve the desired quality. *See*, for example, Zhang at sections [0053] and [0054]. However, unlike the claimed invention, each "layer" in Zhang, regardless of the size, is rectangular. Zhang fails to teach "*each column has $k_i^{(1)}$ information symbols, and wherein $k^{(1)}$ is an array that has at least two different values*". Rather, Zhang teaches only one value for the number of symbols in each column of any particular "layer". For example, contrast Fig. 8 of Zhang with Figs. 2-4 of the present invention.

This difference is important because, as stated in the present application in section [0028],

> Allowing an irregular structure in one of the dimensions of the array code results in a code with thinner spectrum or a smaller number of code words with a Hamming distance of d_{min}. Therefore, irregularity provides a mechanism for producing codes that have a thinner weight spectrum resulting improved performance at lower SNRs found in many applications.

Therefore, Fig. 8 of Zhang and the associated text fails to teach "*each column has $k_i^{(1)}$ information symbols, and wherein $k^{(1)}$ is an array that has at least two different values*" as recited in claim 1 of the present invention and, therefore, fails to teach the advantages of the present invention as set forth above.

Zhang also fails to teach "*encoding each column with a code $C_i^{(1)}$ from a family of nested codes $C^{(1)}$, wherein $C^{(1)}$ includes two different nested codes*", as recited in claim 1 of the present application. Zhang may teach encoding different columns with different codes, but not in the same data array. As discussed above, Fig. 8 of Zhang shows four different data arrays. It is well know to encode columns in different arrays with different codes. However, the cited portion of claim 1 from the present invention is applied to a single data array, and Applicant submits that the cited art also fails to teach this element.

Therefore, Applicant submits that Zhang fails to teach at least several elements recited in independent claim 1. Accordingly, Applicant submits that claim 1 is in condition for allowance.

Claim 2

Claim 2 depends from claim 1 and recites the method of claim 1, wherein the codes in the family of codes $C^{(1)}$ are selected from the group consisting of BCH codes, Reed-Solomon codes, and Reed-Muller codes. Claim 2 is rejected based on Zhang at section [0056], line 6. In the Background section of the present application, on page 3, Applicant describes several examples of prior art codes including BCH codes and Reed Solomon codes. Applicant does not claim to have invented those codes and none of the claims recite the use of those codes outside of the context of the present invention. However, Applicant believes that there is no such teaching in the prior art to combine the particular elements recited in claims 1 and 2. Furthermore, the only motivation to combine such elements is in the description of the present invention, and not in the description of the prior art.

Therefore, Applicant submits that there is no teaching to combine the known prior art codes with the elements recited in claim 1 and, therefore, that claim 2 is in condition for allowance.

Remaining Claims

Independent claims 3, 6, and 9, are rejected for the same reasons used to reject claim 1 and those claims have limitations similar to at least one of the limitations cited in the above discussion with regard to claim 1. For the reasons set forth hereinabove with regard to claim 1, Applicant submits that claims 3, 6, and 9 are patentable over the cited art.

Independent claim 12 was rejected, in part, by relying on the same portion of Zhang that was used when rejecting claim 1. For the reasons set forth hereinabove with regard to claim 1, Applicant submits that Claim 12 is patentable over the cited art.

Independent claim 17 was rejected in part, by relying on the same portion of Zhang that was used when rejecting claim 1. For the reasons set forth hereinabove with regard to claim 1, Applicant submits that Claim 12 is patentable over the cited art.

Claims 4, 5, 7, 8, 10, 11, 15, 16, 21, and 22 are rejected for the same reasons as claim 2. For the reasons set forth hereinabove with regard to claim 2, Applicant submits that claims 4, 5, 7, 8, 10, 11, 15, 16, 21, and 22 are patentable over the cited art.

The remaining claims depend, directly or indirectly, from the independent claims. Therefore, Applicant submits that the remaining claims are in condition for allowance for at least the reasons stated above with regard to at least one of claims 1 and 2.

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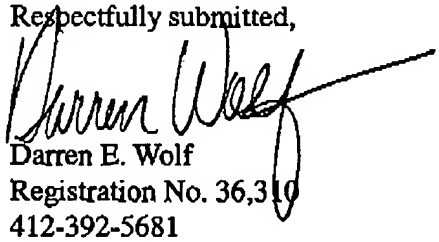
Conclusion.

For the reasons set forth herein, Applicant submits that all claims are in condition for allowance and Applicant respectfully requests that the rejections in the Action be withdrawn and that the application be passed to allowance. If the Examiner has any questions pertaining to this Response or to the subject matter of the present application, the Examiner is encouraged to contact the undersigned.

Applicant believes that no fees are due with this Response. However, in the event fees are due with this Response, the Commissioner is hereby authorized to debit such fees from Charge Account Number 50-3198, in the name of Dickie, McCamey & Chilcote.

Respectfully submitted,



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